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A REVIEW OF THE GENUS *ROEDERIODES* COQUILLETT WITH THE DESCRIPTION OF A NEW SPECIES (DIPTERA: EMPIDIDAE)

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J. G. Chillcott revised the genus *Roederiodes* in 1961, describing five new species. Since that time, more material has been collected and now some of the species can be better defined. The purpose of this paper, the first of a series seeking to revise all the clinocerine empidid genera, is to review the genus *Roederiodes* and update Chillcott's 1961 paper.

Adults of *Roederiodes junctus* Coquillett have been observed capturing and feeding on adult blackflies. Peterson and Davies (1960) reported adult *R. junctus* feeding on adults of *Simulium venustum* Say in Algonquin Park, Ontario. The blackflies were captured from swarms by flying *R. junctus* individuals, and from the water surface by females skimming on the surface film. Needham (1901) reported larvae and pupae of the same species associated with simuliid pupae and empty pupal cases, the *Roederiodes* pupae being found in empty simuliid pupal cases.

Large numbers of *R. junctus* adults have been found beneath pieces of board which were positioned just above the water surface (Needham, 1901). I have observed *R. wirthi* adults resting in a similar manner on the lower surfaces of rocks which closely overhang clear, fast-flowing streams. Mating was observed to take place in these assemblages.

The sharp, piercing mouthparts of *Roederiodes* adults differ from those of most other clinocerines, which are short and relatively haustellate. Adults of such genera as *Clinocera* and *Wiedemannia* feed on small, soft-bodied insects which they capture from thin water films flowing over rocks. It is possible that the more robust mouthparts of the *Roederiodes* adults are adapted for feeding on heavier bodied insects like blackflies. Careful observation is necessary in areas of abundance of these flies to elucidate their feeding habits and prey preferences.

Representatives of the genus occur throughout North America. Frey (1940) described a species from Madeira Island and herein one is described from Cocos Island. This peculiar distribution almost certainly reflects a lack of collecting. Clinocerine empidids in general are not commonly collected because of their tendency to stay close to the substrate and to make only short, low flights along the water surface when they are disturbed. Collecting

on emergent rocks with an aspirator while wading streams is the only effective way to capture most species. *Roederiodes* adults are even more secretive than typical clinocerines, resting beneath overhanging surfaces where they are constantly moistened by water spray. Only an occasional specimen can be collected with a net or flight trap. For this reason, I believe that the genus probably has a much wider distribution than present material indicates.

The name *Roederiodes* was chosen for the genus because of the supposed similarity of its members to the European *Roederia,* now considered to be a subgenus of *Wiedemannia*. The specific epithet of the type species, *juncta,* had the feminine ending. The name was used in that form until Melander's 1927 revision, when it was spelled, without explanation, *Roederioides*. Curran (1934) also adopted this spelling, and it was generally used in that form, even by Chillcott in 1961, until Melander (1965) again used the original spelling, *Roederiodes*. At that time the endings on the specific epithets were changed to the masculine. This is in accordance with the ICZN Article 30(a).(ii).

Key to the Species of *Roederiodes* Coquillett
(Modified from Chillcott, 1961)

1. Proboscis longer than head height ..... *longirostris* Frey
   Proboscis at least slightly shorter than head height 2
2. Doroscentrals 5, strong; ocellar and vertical bristles strong 3
   Dorsocentrals 7–8, weak; ocellar and vertical bristles weak; small median ocellar bristle present ..... *wirthi* Chillcott
3. Acrostichals present and well-developed, numerous; mc crossvein present and distinct ..... *distinctus* Chillcott
   Acrostichals, if present, not occurring posterior to second dorsocentral; mc crossvein absent or very short 4
4. Antennal style twice as long as third antennal segment; basal costal bristle subequal in length to second basal cell ..... *wigginsi* n. sp.
   Antennal style less than twice as long as third antennal segment; basal costal bristle much shorter than second basal cell 5
5. Hind tibia with distinct median ventral bristles; hypopygium with surstylus long, slender and curved anterad .... *recurvatus* Chillcott
   Hind tibia without distinct median ventral bristles; hypopygium with surstylus short and broad 6
6. Dorsal lobe of hypopygium broad and truncate at apex; tip of aedeagus with truncated lateral arms ..... *junctus* Coquillett
   Dorsal lobe of hypopygium more slender, not distinctly truncate; tip of aedeagus with pointed lateral arms ..... *vockerothi* Chillcott

Fig. 1. Wing of *Roederiodes wigginsi,* holotype.

Roederiodes wigginsi, new species
(Figs. 1–2)

Description.—Small body size, 1.8 mm in length; with brown coloration.

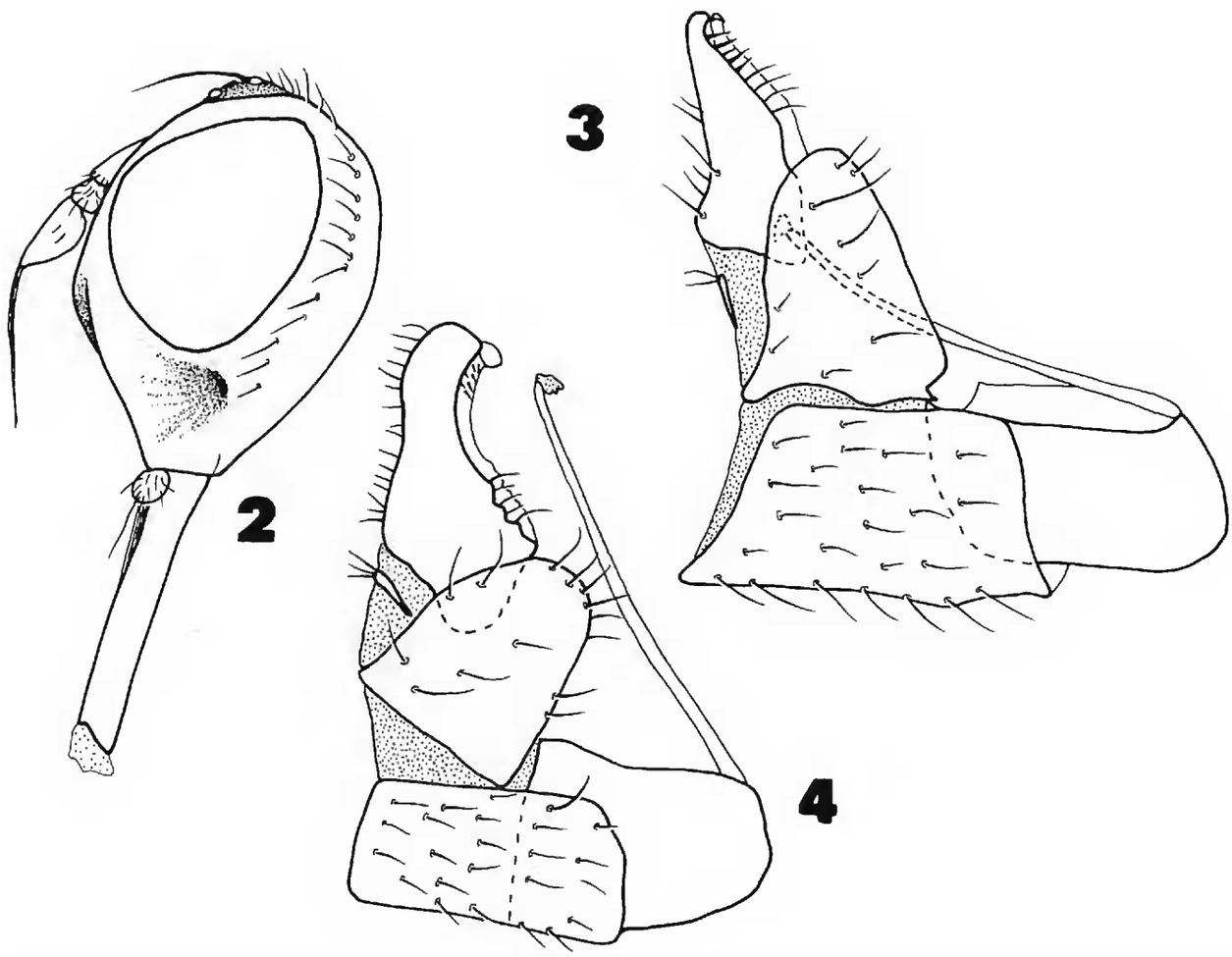
Head (Fig. 2).—In profile widest at lower eye margin, strongly receding to oral margin. One pair of strong vertical bristles present; no setulae present on lower two-thirds of head between eye and postoccipital bristles; one pair of weak genal bristles present. Third antennal segment short ovate, style twice as long as third segment. Proboscis .70 of head height.

Thorax.—Acrostichals absent; dorsocentrals five, strong; two small anterior notopleural setulae. Mesonotal depression concolorous with rest of thorax.

Wing (Fig. 1).—Length 2.3 mm, slightly infuscated. Basal bristle longer than second basal cell. Humeral crossvein not visible, costal cell distinctly darkened. Second submarginal cell four times as long as broad. Medial and cubital veins distinctly coalesced for a distance one eighth the length of the second submarginal cell. Anal vein indicated by a short spur; dorsal half of anal cell infuscated.

Legs.—Uniform brown, slightly paler than thorax. Anterior femora slender; tibiae without distinct median ventral hairs.

Hypopygium.—Male unknown.



Figs. 2–4. Fig. 2. Head of *Roederiodes wigginsi,* holotype. Fig. 3. Hypopygium of *R. distinctus*. Fig. 4. Hypopgium of *R. wirthi*.

Type material.—Holotype ♀, "COSTA RICA: ISLA DEL COCO, Bahia de Chatham, 22-I-1967. Ira L. Wiggins" "California Academy Sciences Type No. 13622." "Holotype Roederiodes wigginsi Wilder 1980."

Discussion.—This species may be distinguished from other known species of *Roederiodes* by the small size, long proboscis, long antennal arista, and the long basal costal bristle. *Roederiodes wigginsi* is named in honor of the distinguished botanist, Ira L. Wiggins, who collected the unique specimen.

The holotype was collected in a flight trap, but despite subsequent flight trap collections, no additional specimens have been found. No blackflies are recorded from Cocos Island, but numerous ceratopogonid midges live in the streams and could serve as a food source for these tiny flies (C. L. Hogue, in litt.).

Roederiodes junctus Coquillett

Roederiodes juncta Coquillett, 1901:585. Holotype ♀, USNM Type No. 5345. Type locality: Saranac Inn, Adirondack Forest Preserve, New

York. Needham (1901:581, figs. 5–8); Melander (1902:239); Coquillett (1903:257); Coquillett (1910:601); Engel (1918:264); Johannsen (1935:20); Peterson and Davies (1960:9, 10, 12).

Roederioides juncta: Melander (1927:225, pl. 2, fig. 9); Chillcott (1961:422, figs. 1, 5, 13, 16, 21, 26).

Roederiodes junctus: Melander (1965:467).

Roederoides juncta: Knutson and Flint (1971:316). (lapsus calami).

Discussion.—Adults vary in length from 2.0 to 3.3 mm; there is little additional intraspecific variation. Members of *R. junctus* are easily distinguished from those of *R. recurvatus* by the structure of the hypopygium (Chillcott, 1961:421), the silvery mesonotal depression, a more rounded head profile, longer antennal style, and the absence of tibial bristles. Chillcott stated that adults of this species differ from those of *R. vockerothi* Chillcott (1961:424) only in minor genitalic characters. The characters used in this comparison are not consistent within other species, however. More material of *R. vockerothi* must be examined before a decision on its status can be made.

Roederiodes junctus occurs in the northeastern U.S. and southeastern Canada. *Roederiodes vockerothi* is represented by one specimen taken in Gainesville, Florida (Type ♂, CNC No. 7185).

Roederiodes recurvatus Chillcott

Roederioides recurvata Chillcott, 1961:424, figs. 3, 6, 12, 14, 17, 22, 25. Holotype ♂, CNC Type No. 7186. Type locality: Old Chelsea, Quebec.

Roederioides juncta: Vaillant (1960:117, figs. 1a–b) (misidentification).

Roederiodes recurvatus: Melander (1965:468).

Discussion.—Adults vary in body length from 2.0 to 3.25 mm; the leg color varies from yellow to dark brown. *Roederiodes recurvatus* adults are generally smaller than those of *R. junctus,* and can be distinguished from them by the distinctive genitalia (Chillcott, 1961:421; Vaillant, 1960:119), the mesonotal depression concolorous with the rest of the mesonotum, the elongate head profile, the shorter antennal style and the presence of ventral bristles on the hind tibia. Examination of new material indicates that the dorsal lobe of the hypopygium is "elbowed" in macerated specimens, but appears to be uniformly curved anterad in dried, unprepared material.

This species occurs throughout eastern North America from Quebec to Virginia and Tennessee.

Roederiodes distinctus Chillcott
(Fig. 3)

Roederioides distincta Chillcott, 1961:425, figs. 4, 8, 23. Holotype ♀, USNM Type No. 65091. Type locality: South Vrain Creek, Boulder Co., Colorado.

Roederiodes distinctus: Melander (1965:468).

Discussion.—Adults vary in length from 2.7 to 3.0 mm; leg color varies from brown to black. Members of this species can be separated from other *Roederiodes* by the distinct mediocubital crossvein, the tuberculate facial profile, the anteriorly inclined eye, and the presence of well-developed acrostichal setae.

Type material did not include males. Subsequent collections have produced a male from Trail River, Northwest Territories (CNC). It conforms exceptionally well with Chillcott's description of the female. The hypopygium (Fig. 3) has the surstylus long, narrow, evenly tapering to a pointed, mesally inclined tip, the inner surface with numerous spines.

At present, this species is known from only the two above-mentioned localities.

Roederiodes wirthi Chillcott
(Fig. 4)

Roederioides wirthi Chillcott, 1961:426, figs. 2, 9, 11, 15, 19, 24, 28. Holotype ♂, USNM Type No. 65092. Type locality: Catron Co., 5 mi E of Glenwood, New Mexico.

Roederioides retroversa Chillcott, 1961:427, figs. 10, 20, 29. Holotype ♂, USNM Type No. 65093. Type locality: St. Helena Creek, Lake Co., California. **NEW SYNONYMY.**

Roederiodes retroversus: Melander (1965:467).

Roederiodes wirthi: Melander (1965:467).

Discussion.—Chillcott's concept of this species was based on a few specimens from widely separated areas. Currently available material from intermediate areas gives a clearer idea of the intraspecific variation.

Roederiodes wirthi adults are easily separated from those of other species by the weak head bristles, the presence of a weak median ocellar hair and the weak and more numerous dorsocentrals.

The head profile of these flies varies considerably, from smooth to tuberculate among individuals of the same series. This was one of the principal characters originally used to separate *wirthi* from *retroversus*. The other significant character used to distinguish the two was the structure of the hypopygium. There is remarkably little variation in the terminalia. The differences which Chillcott mentioned were due to differences in the degree of maceration of the genitalic structures of the specimens. The hypopygium has the surstylus strongly tapering on the basal half, then parallel sided to a rounded-truncate, mesally directed apex (Fig. 4).

The length of the proboscis rarely varies from two thirds (.63–.70) the head height. The number of genal hairs varies from 0–3. The distance for which the medial and cubital veins are coalesced varies considerably from

not at all to distances up to three times the length of the radiomedial crossvein. Leg color varies from yellow to black, the usual color being brown.

Additional material shows that this species ranges from New Mexico into California from San Diego to Lake County. Adults are found associated with small, clear fast-flowing streams.

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Footnote

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